

## Three Sandians Selected by Science Digest

At a time when many of the scientists and engineers who have built Sandia's reputation are now ending their careers, it's reassuring to note that there's a new generation coming up behind them — and fast. Three Sandians are among "America's Top 100 Young Scientists," says the December issue of *Science Digest*. Each winner is under 40.

The three are Wayne Goodman (1134), Gordon Osbourn (1132), and Pace VanDevender (1200). They were selected by a panel of 60 distinguished senior scientists representing universities, laboratories, and private industry. John Galt (now 2000, then 1000) was on the nominating panel; assisted by Fred Vook (1100), John nominated two of the winners from Bell Labs as well as the three Sandians.

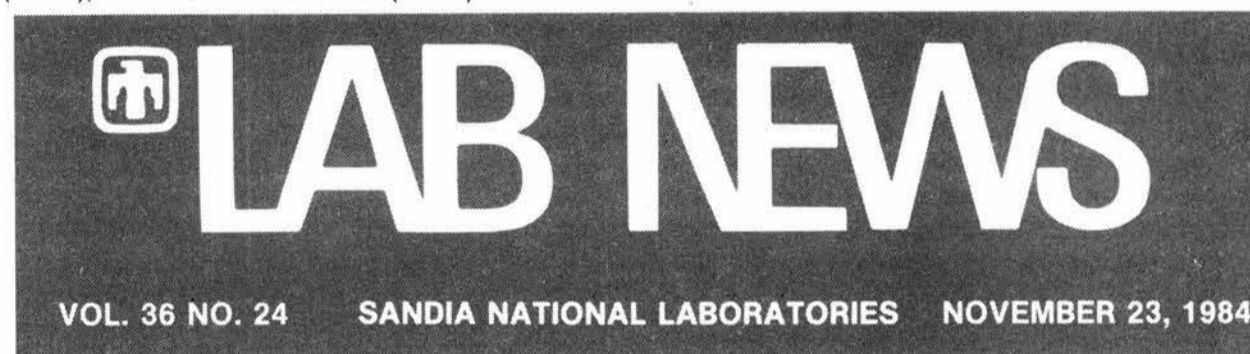
"I think I speak for all Sandians when I say that I'm delighted that our high opinion of our people was seconded by *Science Digest*," says John. "It's welcome confirmation of the quality of our work here."

Wayne won his award in the chemistry category. His citation reads:

(Continued on Page Four)



NATIONAL RECOGNITION for three Sandians came with the current *Science Digest* magazine. They were among the "100 Top Young Scientists" in the country. From left, Wayne Goodman (1134), Gordon Osbourn (1132), and Pace VanDevender (1200).



### An Overview

## Geologic Studies in Long Valley Providing Insight into Volcanoes, Magma Energy

Eight thousand feet up, in a forest clearing on the eastern lip of the Sierra Nevada, Obsidian Dome looms huge through the pines. It's a giant mass of reddish grey and black volcanic rock, more than 150 feet high. Almost completely bare of vegetation, the flow looks fresh, as though it might have crept there during the night.

As a matter of fact, Obsidian Dome — along with its two companion domes in what's known as the Long Valley-Mono Lake region — is young, in geologic terms. Such domes are the most impressive visible clue to a pair of experiments involving several Sandians and a host of researchers from other laboratories, universities, and government organizations.

About six centuries ago, pressures deep in the earth's crust squeezed a massive release of pumice-laden gas from the earth roughly at the center of this site. Its speed was close to supersonic at the time of emergence, its temperature around 850°C. An ashy plume rose perhaps 50 to 60 thousand feet into the atmosphere, depositing fluffy particles called tephra like snow over nearby mountains, devastating the countryside and its wildlife. Days or weeks later a hot, oatmeal-thick foam of molten rock oozed up through the vent, cooling as it spread through the forest, building higher, its bubbles progressively popping until, at the far-



SANDIA LOGGING TRUCK atop Obsidian Dome in Long Valley, Calif. Area is site for two major cooperative studies of magma energy and volcanoes. "Snow" on mountain in background is really volcanic tephra.

thest edges of the flow, the rock tumbled and broke in the form of black, glassy obsidian.

Today the domes are superficially cold, lying like huge pancakes on the California landscape between Yosemite and the Nevada border. The only life on them, aside

from the occasional tourist, is represented by Pete Lysne (6240A), John Rundle (1541), John Eichelberger (1543), and their research colleagues from Sandia and other cooperating organizations.

(Continued on Page Six)

# flexi:liback

Q. I get Savings Bonds in the mail at home each month, sometimes three, sometimes four, and once five at a time. Since each one comes in a separate envelope and I don't know how many to expect, I always worry that some may have been lost in the mail. If they all came in one envelope, or if I knew how many had been sent, I wouldn't have this worry. Can anything be done?

A. Savings Bond issuance is handled by a local bank, which mails the bonds directly to the employee at home. Post office regulations do not permit more than one bond per envelope.

Two factors contribute to the variable number of bonds per month you have been receiving. Twice each year there are three biweekly paydays in a month. Also, your deduction amount is not evenly divisible by the purchase price of the bonds you have selected; thus you have a remaining balance at the end of each month. This balance increases each month until the amount is sufficient to purchase a bond.

You can make the number of bonds per month predictable by changing your deduction to match bond purchase prices. If it fits your redemption plan, you could also reduce the number of bonds by selecting a larger denomination bond.

Please feel free to talk with the deduction clerk or supervision in Payroll to discuss workable combinations and/or to get a refund of any outstanding odd balance.

P.M. Stanford — 100

## Big Brother May Be in Your Car



In *The Rise of the Computer State* (Random House), David Burnham "reveals that computers in some cars can actually spy on the owners, although General Motors denies it. The computer can tell 'how many times the car has been driven faster than 85 miles an hour and also how many times the engine was started after the 'check engine' message first lit up on the dashboard.' GM explained that the computer 'is just to help mechanics repair cars.'"

(David Wise in *Manchester Guardian Weekly*, Jul. 10, 1983)



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# Antojitos

Of Relaxed Tires and Unremembered Acts Last week I got a memo that asked me to publicly thank the person who left this note on a fellow Sandian's car: "Your left rear tire is relaxing badly." I don't intend to do that, except incidentally. And it's not because I have a problem with "relaxing badly."

But I am going to discuss the reasons LAB NEWS doesn't publish this kind of thank you. For one thing, there are too many such incidents. And that's good--it says we Sandians care.

More important, I think we too often say "Thank you" and consider our debts repaid. I don't want that to happen. What I want to do is to fantasize that the owner of the relaxed tire is never able to feel that the benefactor was thanked, never knows who helped him/her, and is therefore quick to help someone else who needs help in the future --after all, it could be the person who left the note on the car.

Chances are, of course, that it won't be. Someone else entirely will reap the benefit of an earlier act of caring. And that someone will, we can hope, continue the chain indefinitely.

Most important, if we publish a thank you, the thanked person may come forward to take the credit offered. And the original urge to help someone else and not take credit for it is destroyed. Yes, our altruistic ambitions get bent sometimes. But I'm enough of an idealist to believe that Wordsworth was on to something valuable when he wrote of "That best portion of a good man's life,--His little, nameless, unremembered, acts Of kindness and of love."

Even if this nameless act of kindness is unremembered in the future (and it well may be), it was well worth doing. ●BH

\* \* \*

If you see someone approaching with the obvious intent of doing you good, run for your life. --Henry David Thoreau

## Schmitt Joins CAM-I Board

Heinz Schmitt, director of Design Engineering Services 7600, was recently elected a member of the board of directors of Computer Aided Manufacturing-International (CAM-I) at the group's meeting in Clearwater, Fla. He is the first Sandian to be named to the board.

CAM-I is a nonprofit corporation that supports cooperative research and development among universities, laboratories, and private industry in the computer-aided manufacturing field. Membership is not restricted to the US: seven directors represent North America, six Europe, and two Japan. And the group's efforts are not restricted to manufacturing: modeling, design, product definition, fabrication, and inspection are also part of the CAM-I efforts. "Recently, producibility, 'deliverables,' and integration are being emphasized within the efforts that CAM-I sponsors," Heinz notes. "And those are goals supported at Sandia as well."

He was a logical choice for a position on the CAM-I board -- Sandia has been a corporate member for five years and, more important, has the lead lab role in DOE's CAD-CAM integration efforts in the weapons complex. Sandia also is a sponsor of CAM-I's Geometric Modeling and Advanced Numerical Control (NC) programs.

"I look forward to serving on the board," says Heinz. "The new board will be emphasizing integration, a major new impetus within CAD/CAM. We're involved extensively in weapons complex/Sandia integration as well as geometric modeling and NC work. So I feel I'll be able to contribute to



Heinz Schmitt

the primary function of the board -- that is, to direct and monitor the joint research being done in these areas around the world.

"I was especially impressed by the scope of CAM-I's activities and the international flavor. It's an excellent opportunity to get an overview of the work that CAM-I is involved in. Yes, I look forward to serving on the board."

Heinz joined Sandia in 1960 as a member of the Technical Development Program. He worked in several organizations -- quality control, computing, component design, and structural and dynamic analysis -- until 1968, when he was transferred to exploratory systems development. He was promoted to supervisor of that division later that year.

In 1976, he was named manager of the weapon development department. He assumed his present position in 1983.

## Supervisory Appointment



CLIFF SKOOG to supervisor of Technical Security Division 8266, newly created, effective Nov. 1.

He joined Sandia Livermore in 1962 to work in the telemetry development group. His assignments since that time have included instrumentation development, studies of radiation effects on fiber optics, work in the electrical groups for the B83, and the exploratory systems division. He is also a BSME and technical institute recruiter.

His education includes bachelor and master degrees in EE, the first from San Jose State and the latter from UC Davis.

Cliff and his wife Harriett (8022) live in Livermore. They have two grown sons. Cliff's hobbies are woodworking, fishing, and photography.

## LEAP Sets Two Records

Sandia Livermore set two records in the LEAP (Livermore Employees Assistance Plan) campaign this year: 1) by raising \$107,725, the highest amount ever pledged, and 2) by giving an average of \$117 per employee participating, the highest *per capita* gift ever.

Dick Claassen (8000) was pleased at the news: "The LEAP committee has been unusually successful this year. A noon hour Information Faire involving the local agencies and a number of exciting, informal competitions helped raise the interest of Sandians in the LEAP campaign. Bill Ormond [chairman] and Mike Birnbaum [deputy chairman] deserve thanks for their special efforts, but the real credit goes to the 919 employees who committed their support for the year."

Employees gave some \$2700 more than the goal of \$105,000 established by the LEAP committee for the year. This will enable the committee to increase slightly the total given to the 17 local agencies selected for support during 1985. Also showing a sizable jump was the number of Fair Share contributors (those pledging 0.6 percent or more of their salary). The number quadrupled this year, going to 106 from the 1983 figure of only 25.

## Take Note

Marlin Pound (8024) was recently elected to a fifth four-year term on the Livermore Area Recreation and Park District board of directors. He has been serving as chairman of the board this year, a post he has held four times.

### Congratulations

Phil (8175) and Norma Calderon-Zablocki (8265), a son, Joshua Eric, Nov. 4.



# SANDIA LIVERMORE NEWS

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### Planes With a Twist

## Ghio's a National Champ

Walt Ghio (8431) is a high flier, but his feet never leave the ground. The planes he "pilots" are rubber-band-driven models with a 60-inch wingspan.

This is no backyard hobby for the uninitiated. Walt has flown in four world championships over an eight-year period (world events are scheduled every other year) and this year earned a trip to Yugoslavia for the 1985 competition next summer.

There are three classes of free flight model competition: the F1B Wakefield Rubber class in which Walt participates, the F1C motor-powered class, and the F1A towline glider class. A worldwide aviation governing agency, the Federation Aeronautique Internationale headquartered in Paris, sets the rules for all competitions as it does for all aviation including private and commercial prop-driven and jet aircraft.

In the United States the Academy of Model Aeronautics conducts the final events that lead to a team's being selected for international competition. Walt competed in Texas recently against 35 other Americans and came out in the top three. There are nine winners, three in each class, who will be sent to Yugoslavia, all expenses paid. Preliminary runoffs are held on a state and regional basis.

"The challenge is to build the models within weight, wing area, and amount of rubber requirements, then to fly them for a minimum amount of time specified, not for distance or altitude," says Walt. The contest is seven rounds (one hour each) and a maximum flight time of three minutes. If more than two competitors have a perfect score, a flyoff is held. The flight time is then raised by one minute for each flight. Usually the final round means five or six minutes of free flight. High time wins.

Walt began his hobby as a boy. Like many youngsters back in the 50s, he built balsa wood airplanes from drugstore kits. He next tried the gas engine models, and by 1965 found himself a serious hobbyist competing for the Gas Models Association in Stockton, where he still lives. But it was 1977 before he made it all the way to the world champs.

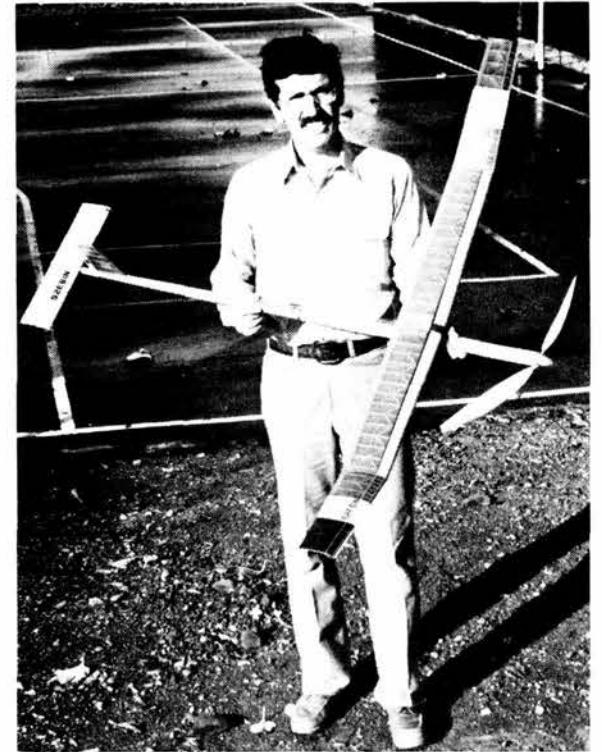
### Sympathy

To Bob Franssen (8176) on the death of his grandfather in Manteca, Aug. 23.

To Doris Pouard (8024) on the death of her father in Livermore, Nov. 4.

To Dennis Sparger (8362) on the death of his mother, a Sandia retiree, in Livermore, Nov. 7.

Eric and Terry Davies (8351), a son, Adam Patrick, Nov. 12.



MEET SHADOW, a model rubber-band-powered airplane that helped owner/builder/flyer Walt Ghio win a US championship. Walt, Shadow, and other planes in Walt's hangar will go to Yugoslavia next summer for the world championships.

"The trick in staying up for the longer flights," Walt explains, "is to find a thermal updraft into which you launch your wound-up model." To assist the fliers in seeking out the ideal conditions, they use such devices as thermistors, tall poles with mylar streamers, dried cattail "fluffies," and even soap bubbles. "But there's also a time frame in which each team must fly, so you can't wait hours for just the right updraft," Walt points out. For example, each team has one hour during which time three flights must be completed.

There are dangers involved for the small fragile crafts. Probably the least expected hazard occurred during the 1983 world championships in New South Wales, Australia. Magpies attacked the plane that one of Walt's teammates was flying and grounded it. Yet the contest officials refused to allow him a reflight, citing the rules that state only collision or interference from another competitor's craft is cause for a second launch.

Walt, who has come in 20th and 5th in the last two world meets, loves the hobby so much that he packed up his models for a family vacation in Europe this past summer. He managed to visit friends and fly in Holland and Israel while taking in the usual tourist attractions as well.

Those who pursue the hobby are sometimes in fields related to design and engineering work. Walt, a technician, has as his US teammates for the upcoming Yugoslavian championships an engineer from Lockheed and a technician from Hewlett-Packard. The two hail from Los Angeles and Austin, Texas.

## Three Scientists

For decades, scientists have used substances called catalysts to promote useful chemical reactions, but without understanding exactly how they work. Goodman, 38, of Sandia National Laboratories, is focusing his efforts on catalytic reactions of hydrocarbons, including those important to synthesizing methane and gasoline from coal. He has developed techniques to measure how a catalyst's molecular structure is affected when in a vacuum and at normal atmospheric pressure. This kind of research may limit the number of modifications designers employ to make catalysts more efficient.

Wayne came to Sandia in 1980 and joined the Surface Physics (now Surface Science) Division 1134. He won the American Chemical Society's Ipatieff Prize in 1983. He holds a PhD in physical chemistry from the University of Texas.

Gordon's award came in physics. His citation reads:

At the heart of electronic chips are crystalline materials called semiconductors that give these devices their special electronic properties. Before Osbourn, 30, of Sandia National Laboratories, pioneered the new field of strained-layer superlattices (SLSs), it was thought that the best semiconductors had to consist of either relatively thick single layers of one type of material or multiple crystalline layers with the same atomic spacing between each. Osbourn and his coworkers demonstrated that an SLS, a sandwich of as many as 100 thin crystalline layers with different atomic spacings, works just as well.

"With bulk-layer semiconductors you essentially have to take what nature gives you, but an SLS has properties we can control," says Osbourn. As a result, these semiconductors can improve the operational characteristics of devices such as solar cells, infrared detectors, and electronic switches.

Gordon joined the Compound Semiconductor Research Division (now 1141) shortly after earning his PhD in solid state physics from Caltech in 1979. In 1983, he was promoted to supervisor of Electronic and Transport Phenomena in Solids Division 1132.

He notes that Sandia's SLS accomplishments are the results of a team effort in the 1100 directorate and that the *Science Digest* recognition reflects the high caliber of work by all members of that group.

Pace also won his award in the physics category. His citation reads:

VanDevender, 37, has helped lay the groundwork for controlled fusion. By imploding fuel pellets containing isotopes of hydrogen, he and coworkers at Sandia National Laboratories plan to duplicate conditions similar to those inside the sun or a hydrogen bomb.

VanDevender's work with high-power switches, magnetic insulation, and ion-beam focusing — all part of a fusion technique called inertial confinement — was instrumental in successful experiments this year to concentrate a trillion watts on an area the size of a BB.

## Retiree Mike Zownir Invents Device to Help Pool Shooters

Mike Zownir, who retired in 1978 after 26 years as a Sandia machinist, has a couple of new titles these days — inventor and entrepreneur. He runs a mail order business selling some handy devices that he invented for pool shooters: the Zee Cue Tip Truer and the Zee Cue Tip Trimmer. He received a patent on the Cue Tip Truer last month.

"What the Truer does," Mike says, "is shape the pool cue tip into a perfect .416-inch radius — the curve of a nickel's edge, which any pool shooter will tell you is what you need for shooting pool.

"My brother Myron is a professional pool shooter," Mike continues. "I used to watch him shape his cue tip with sandpaper, eyeballing it every couple of strokes, for hours before a tournament. It was such a painstaking, time-consuming operation that I figured there had to be a better way."

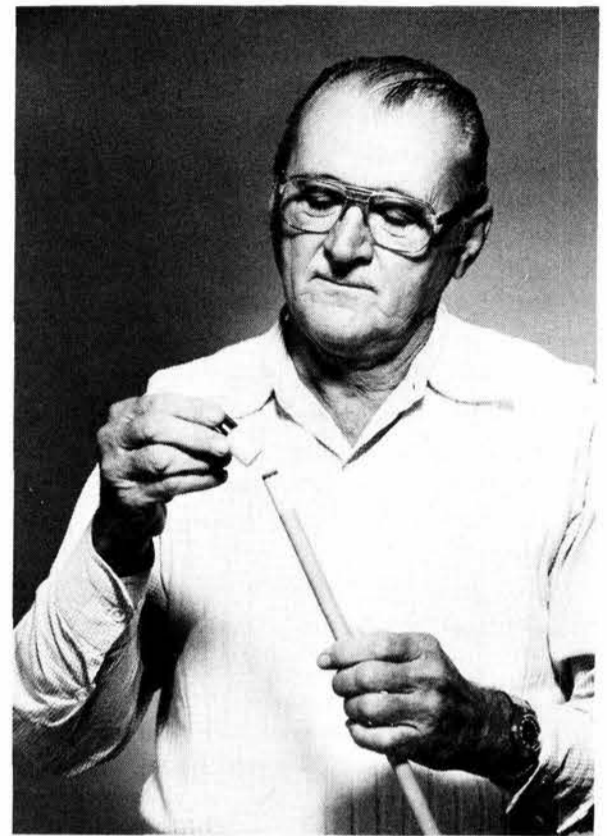
Mike's solution is a little gadget that fits directly over the end of the cue stick. A disk of sandpaper is recessed in the bottom of the device, its concave curvature shaped to match the curve of a nickel. Turn the Truer on the end of the cue, and presto! you have a perfectly true tip.

The tip of a cue is cut from hard leather. Eventually it wears out. So you replace it. Mike's Truer helps in this process too. Unscrew the gadget and insert a flat metal disk in front of the recessed concavity along with a flat disk of sandpaper. Insert the cue tip ferrule, turn it a few times, and you have a clean, perfectly square surface ready for gluing on a new leather tip. After the glue sets, you unscrew the end of the Truer, remove the flat disks of metal and sandpaper, and use the concave cavity to put the nickel curve onto your new tip.

The second gadget, the Zee Cue Tip Trimmer, helps a little later. As you use the new tip the impacts of tip on cue ball tend to make the leather flare out at its edges. Mike's Trimmer, resembling a child's pencil sharpener, fits precisely around the edge of the cue tip. Its blade trims the flare as you rotate the cue — the same action that sharpens the child's pencil but with greater precision.

By 1990, when the technique can be applied to 100 trillion watts, the scientists hope to use it to fuse a sample of fuel. They hope to reach the break-even point, when a reaction produces more energy than it took to initiate it, five years later. "Eventually," he says, "we hope to put power on the grid, and that will happen about the year 2020, or twelve years after I retire."

Pace came to Sandia's pulsed power organization after earning his PhD in physics from the Imperial College of Science and Technology at the University of London where he was a Marshall Scholar. He was promoted to supervisor in 1978, to department manager in 1982, and to director of Pulsed Power Sciences 1200 in August, a few months after he was



RETIREE MIKE ZOWNIR demonstrates his Zee Cue Tip Truer that puts a precision curve on the tip of a pool cue. The device was recently patented.

"Serious pool shooters pay a lot of money for their cue sticks," Mike says. "They wouldn't stand for scratches on the ferrule. My devices are quality products, precision machined from aluminum and hard plastic."

Business is pretty good. Mike has advertised in several magazines, such as *Billiard Digest*, that cater to pool shooters and billiard players. A few orders come in every day. When his supplies run low, Mike heads for the facilities at Model Products Inc., puts on his machinist's apron, and manufactures a few hundred more.

Mike also advertises his gadgets at national pool tournaments. He was in Milwaukee with his brother a couple of months ago, in Las Vegas last June. He meets guys like Minnesota Fats, demonstrates his little gadgets, makes a few sales, and covers expenses.

"It's great fun," Mike says. "Retirement is supposed to be fun. I shoot a little eight or nine ball once in a while, but never with the pros."

nominated for the *Science Digest* award.

"Research at Sandia has been extremely exciting because of the technical challenge and the people. My colleagues in the fusion program deserve their share of this award," says Pace.

All three people are in the Research organization. Their vice-president, Bill Brinkman, is understandably proud of them: "The honor recognizes their outstanding accomplishments and underscores the high caliber of the research we're doing at Sandia."

In addition to the Sandia trio, the national weapons labs were represented by five scientists from LLNL and four from LANL; Bell Labs had four winners, AT&T Technologies one.

## Events Calendar

- Nov. 23 — Las Tapatias Hispanic Dance Company and Las Amigas y Grupo Ritmo, 7:30 p.m., KiMo, 766-7404.
- Nov. 24 — KiMo Guitar Series: classical guitarist Mario Abril, 8 p.m., KiMo, 766-7816.
- Nov. 26 — Clearsearch, traditional Irish Folk Harp, 7:30 p.m., KiMo.
- Nov. 30, Dec. 1-2 — Ballet Renaissance West's production of "The Nutcracker Suite," Fri. & Sat. 8 p.m., Sat. & Sun. 2 p.m., KiMo, 766-7404.
- Dec. 2 — Movietime at the KiMo, Movies by Great Directors, "Intolerance," D.W. Griffith (1916), KiMo.
- Dec. 2 — NM Brass Quintet in concert at Immanuel Presbyterian Church, 114 Carlisle SE. New Covenant Chorale joins the quintet for the Christmas Cantata finale. Information at 265-7628.
- Dec. 2 — Zapatitio Puppets, brings to life the ancient traditions of folk tales, proverbs, acrobatics & dreams, 1-4 p.m. (program begins at 2), Maxwell Museum (University Blvd. one block north of Grand), 277-4404.
- Dec. 4 — NM Symphony Orchestra & Chorus, "Christmas at the KiMo," free concerts, 6:30 & 8:30 p.m., KiMo.
- Dec. 6 — NM Museum of Natural History lecture and slide show: "Grizzly Bears," 7 p.m., KiMo.
- Dec. 7 — Cleo Parker Robinson Dance Ensemble, modern dance, 8 p.m., KiMo, 766-7816.
- Dec. 8 — Shalako Ceremonial, Zuni Pueblo, 1-782-4481.



BOB RIEDEN (2121)



MARV MORRIS (7553)

## Supervisory Appointments

BOB RIEDEN to supervisor of MOS IC Product Engineering Division 2121, effective Nov. 1.

Since coming to the Labs in 1962, Bob has worked with the firing set development group and the IC bipolar integrated design organization. For the past year he has been with Adversary Analysis Division 7234.

Under Sandia's Educational Aids Program, Bob attended UNM and received his BS in EE in 1972 and his MS in EE in 1976. Bob is a ham radio operator and has been a member of the Sandia Search and Rescue Team for 10 years; he's served as president of the group. He's also a long-distance runner and has run in six marathons in the last five years. Bob is building a passive solar house in the mountains on South Highway 14. He and his wife Barbara have a married daughter and a son attending UNM.

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MARVIN MORRIS to supervisor of Electromagnetic Analysis Division 7553, effective Aug. 16.

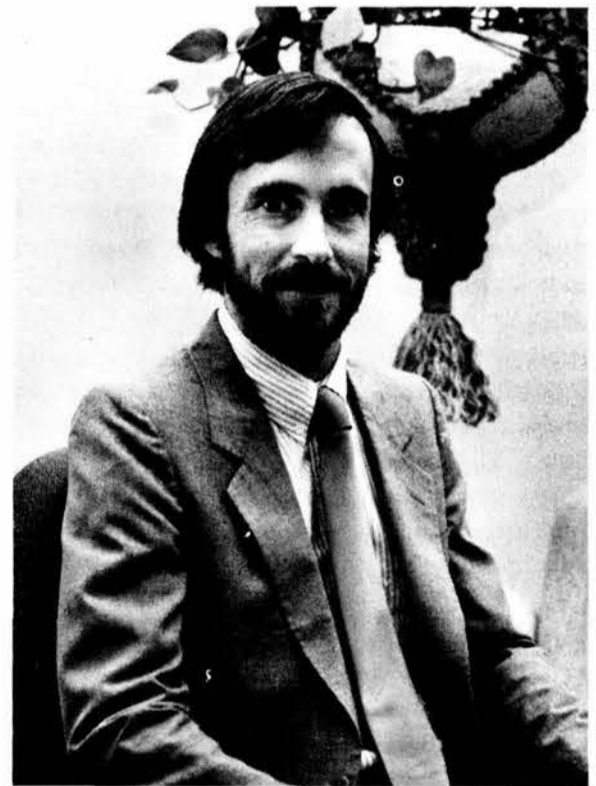
Following his graduation from NMSU with a BS in EE, Marv joined the Labs' manufacturing development group in 1965 as a member of the Technical Development Program. He received his MS in EE from UNM in 1967. He then worked with the planetary quarantine group that was studying methods for sterilizing space craft. Marv was selected as a member of the Doctoral Study Program and received his PhD in applied physics from Harvard in 1977. Since 1980 he has worked with the division he now supervises.

Marv's favorite activity off the job is playing handball. He and his wife Lorinda have two children and live in the NE heights.

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RON LIGHT to supervisor of IC Lithography and Pattern Transfer Division 2148, effective Nov. 1.

Since coming to Sandia in 1980, Ron has been working on plasma etching and photolithography processes. His most



RON LIGHT (2148)

recent assignment was with Integrated Circuit Processing Division 2141.

Ron received his BS, MS, and PhD in chemistry from UNM. He is a member of the American Chemical Society, Electrochemical Society, and the American Association for the Advancement of Science. Ron enjoys bicycling and playing the guitar. He and his wife Jane and their two children live in the NE heights.

### Congratulations

Bill (7265) and Julie Davidson, a son, Bryan Richard, Oct. 10.

Veronica Chavez-Soto (7265) and Eddie Soto, a daughter, Victoria Enrica, Nov. 11.

John Miller (3418) and Glenda Miller, married in Las Vegas, Nev., Nov. 2.

### Sympathy

To Florenio (3423) and George (151) Baldonado on the death of their sister in Morro, La., Oct. 26.

To Ernest Cordova (7482) on the death of his son in Albuquerque, Sept. 20.

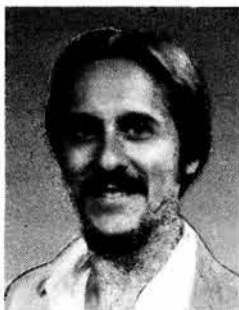


Here are a couple of current volunteer opportunities for employees, retirees, and family members. If you would like more information, call Karen Shane (4-3268).

CHAPARRAL HOME AND ADOPTION SERVICES is looking for adoptive families to speak to birth mothers at the maternity home. Families that have adopted children are asked to share their experiences and feelings.

KNME-TV5 has again asked Sandians to be "phone friends" for its on-air fund drive on Tuesday, Dec. 4, 5:30 to 11 p.m.

## Death



Kent Hoffman of Surface Physics Division 1134 died Nov. 5 in a motorcycle accident. He was 26.

He had worked at the Labs since June 1981.

He is survived by a daughter.

## Two Studies — Volcanoes, Magma

The peaceful setting is in a sense misleading. The volcano is grumbling. Unknown tectonic forces have, since 1978, caused large earthquakes to shake the town of Mammoth Lakes, with aftershocks that were economic (in terms of local land values) as well as geologic. Small earthquakes have come in swarms. Back roads are blocked with boulders and with trees whose roots have been steamed to death in the hot earth. New fumaroles — miniature geysers — appear unexpectedly like steamy wraiths at roadsides and in the woodlands,

### Old Drillholes, New Insights

## To Profile Magma Chamber, Listen to the Earthquakes

Sleet is driving down on the streets of Mammoth Lakes as John Rundle (1541), project leader and chief scientist for the 1984 Downhole Experiment, pilots his Jeep Cherokee northeastward across a stretch of the Long Valley caldera to the baby mountain called the Resurgent Dome.

He's on his way to an old drillhole that probes 3000 feet into the earth next to a huge magma-filled chamber. At the bottom of the hole is a cluster of instruments that listen for earthquakes on the far side of the magma. What, if anything, he wonders, will the earthquakes tell him today?

On this cold, damp day, steam from numerous fumaroles rises high along Hot Creek, from the scalding hot pools at Casa Diablo to the 7.5 Megawatt Ben Holt ge-energy power plant a few miles to the north.

In this general area lies the great body of subterranean magma, ranging from three to seven kilometers down, that has caused the valley floor to bulge a half meter in the past four years. The deformation is slight compared with the width of the valley but possibly significant as an indicator of rising magma in the chamber below.

In this general area too lies the epicenter of most of the earthquakes that have visited Mammoth Lakes in the past four years. Volcanism has left its mark everywhere, and some of the marks are very recent. At one point, boulders blocking the trail force travelers to take an alternate route — this one barricaded by a tree that died as steam percolated the earth in which it is rooted.

John's program is a cooperative project with Occidental Petroleum, University of Southern California, LBL, U.S. Geological Survey (USGS) and University of California Santa Barbara. It is funded by the DOE Magma Energy Program, the Continental Scientific Drilling Program (CSDP), National Science Foundation, and others including the USGS.

Basically the 1984 Downhole Experiment aims at profiling a magma chamber through the interpretation of signals received from small earthquakes. Transducers are emplaced in a drillhole located at the side of the magma chamber opposite the area where most of the earthquakes originate. The resulting data — recently from an average of

attracting the financial interest of ge-energy developers. The hot springs are larger and hotter; there's good sense in the signs that warn seekers of hot baths that they may be scalded in the Casa Diablo spring.

The grumbling volcano has made Long Valley-Mono Lake a volcanologist's mecca. Experts from all over the country have pooled their experience and brainpower in two cooperative ventures that bring scores of scientists together as peers at the domes, at the microscope, at the computer — and on shift at the drill sites.

approximately five small earthquakes per week — are included with data from USGS monitoring stations to infer boundary locations and geometry along the magma/basement rock (granite) interface.

Potential applications of the data gathered would include relatively simple and accurate assessment of candidate sites for magma energy production, and *in-situ* measurement of the physical properties of magma.

When seismic acoustic waves pass through magma, their form is altered because the viscosity of the magma causes a loss of shear energy; the seismic signals are therefore relatively low in frequency and amplitude. "By modeling the waveform you can analyze where the changes occurred in the crust," John explains. "When enough signals are analyzed, it will be possible to build up an image of the magma chamber. The technique is analagous to the CAT (computer-aided tomography) scanning used in medicine."

Richard Striker, a 1541 staff associate,



JOHN RUNDLE inspects some white hydrated rocks around a small fumarole on Resurgent Dome.

designed the instrument package. Marianne Walck, a new employee from Caltech, will be assisting with data analysis. Greg Elbring, also a new staff member in 1541, will assist with fieldwork and data interpretation.

John's work is of particular interest to Jim Dunn, supervisor of Sandia's recently formed Magma Energy Project Division 6242, which has provided funding for the program. "We're looking for a concentration of magma around five to seven kilometers deep to serve as the main site for a magma energy engineering feasibility study," says Jim. "The primary objective is to conduct a very small scale experiment — drilling into a magma body, inserting extraction equipment, and doing a fairly long experiment to determine the feasibility of tapping the thermal energy."

Two primary sites have been selected — Long Valley and the Coso Hot Springs area, about 120 miles south of Mammoth Lakes. "We'll be studying these areas with a range of geophysical techniques, and John's is one of them," Jim explains. "These studies will give us an indication of the location of the

(Continued Next Page)

### Local Residents' Fears More Economic than Seismic

In an area where the resident population is small and there is a threat to property, the experts naturally come into contact with the locals. John Rundle has had a series of conversations with Barbara Campbell, tour coordinator for local motels and member of the city council (Mammoth Lakes was incorporated only in August 1984).

Barbara believes that real estate values dropped by more than 50 percent following the 1980 swarm of earthquakes. Soon thereafter she bought volcano and earthquake insurance for her property. One of the trunks packed when the (Richter) magnitude 6 earthquakes hit remains packed — with family photos — but she says it's just an oversight. She says she has come to live with the idea that the volcano could erupt catastrophically, but she

seems confident that she would have sufficient time to leave the area if eruption seemed imminent.

With a wry smile, she tells a visitor that someone in Reno had believed a fictionalized article in which lava was running down the streets of Mammoth Lakes (a thick blanketing with hot ash would be a more likely scenario if and when the volcano erupts), and adds ruefully that the State of California is using the town's evacuation plan in a disaster exercise.

Barbara believes her attitude is fairly typical of Mammoth Lakes residents. John agrees, though there are still reports that local leaders remain apathetic about the volcanologists, and that the citizens have desensitized themselves to the volcano threat, small as it is at present.



LIKE A MONSTER SLAG HEAP, Obsidian Dome encroaches on the forest. Sandia trailers are among pines in right center.

shallowest and therefore most accessible target.

“By putting a receiver downhole (as in John’s experiment) you get away from a lot of the surface noise problems; also, the closer you are to the actual body, the less problem you have in extracting the needed signals from all the signals you receive.”

John’s current project started in March 1984 with a conversation with Occidental Geothermal scientists in Bakersfield. “It became apparent that they had wells in the Long Valley area that would be suitable for scientific work,” says John. “This meant we could save ourselves the cost of drilling, which would be the most expensive part of the proposal.

“After we had planned this activity, in April, Greg Elbring and I went to the USGS in Menlo Park to discuss crustal imaging in

Long Valley generally, and, specifically, to determine which would be the most significant imaging target in the valley. It turned out that we could do an integrated crustal imaging experiment at the Occidental well site because it was located right over what was thought to be a body of shallow magma.

“Later it was decided that the group would do conventional surface reflection profiling, a vertical seismic profile in the well, and passive recording of earthquakes occurring in the south moat (part of the Long Valley caldera). All participants would chip in to fund these projects.”

At the May American Geophysical Union meeting at Cincinnati, the experiment was “adopted” as a prototype for future crustal imaging experiments by the committee on lithospheric studies of the Incorporated Research Institutions for Seismology. This is a new research cooperative set up by a

group of 50 institutions, mostly universities but also including the USGS and some national laboratories.

Work got underway at the Resurgent Dome site on Sept. 7 and continues to the present. Actual drilling took a week, involving drilling through Occidental’s concrete cap and then through 3000 feet of existing well to clean it out.

In October the wellhead was vandalized, and USC recording instruments with some seismic records were stolen. Then the snow came — two feet of it at the site. Alan Ryall of the University of Nevada arranged to link the wellhead with his satellite telemetry system, to give real-time information on seismic activity throughout the winter from downhole. About 60 three-component seismic records have been collected to date, and data processing on these has already begun.

The first paper on the imaging experiment will be given at the fall meeting of the AGU in San Francisco Dec. 3-7. The paper, presented by John, will discuss the joint efforts of John, William Ellsworth (USGS Menlo Park), Tom McEvilly (Lawrence Berkeley Laboratory), Tom Henyey (University of Southern California), Peter Malin (University of California at Santa Barbara), and Scott Smithson (University of Wyoming). There will be a special session on crustal imaging in Long Valley at the spring 1985 AGU meeting in Baltimore.

John is currently organizing an imaging experiment for January: big “thumper” trucks will create shear waves that will be recorded as they are echoed by the magma. After that? Well, Occidental has begun drilling a 10,000-foot well on the Resurgent Dome, and John has his eye on it. If he could get geophones down to the bottom of that well, he’s convinced he could get some of the best data yet.

### **Toward Understanding Volcanic Evolution**

## **Team Drills into Young Magma Conduit**

Pete Lysne (6240A) pulls his red pickup to a halt beside a trio of nondescript trailers between Obsidian Dome and its companion to the south, Glass Creek Dome.

It’s a cold morning, and the day shift is starting on Pete’s volcano drilling watch.

Pete removes the padlock from its hasp and prepares to check the night’s progress from written logs, the growing collection of drill cores, and computer printouts [he and John Eichelberger (1543) devised a computer program called CORE that compiles data from a simple interactive question-and-answer routine].

Cores from the hole are laid in corrugated cardboard boxes, hash-marked to show which way is up, 10 feet per box. “It looks like granite, and it is,” says Pete, “but it’s friable.” He pinches the rock between thumb and forefinger, and it crumbles like stale blue cheese. It’s old rock, he explains, but points out newer rock lying across the cores in grey streaks. These are rhyolitic fragments — volcanic rock — meaning the drill is getting closer to the dike, a sheet of magma that was squeezed upward by enormous pressures acting on the main chamber, and which then cooled.

A physicist, Pete likens the creation of the domes to popping a bottle of champagne: first the gas, then the liquid flow. He explains that these are some of the most recent lava flows in the United States, and that they are accompanied by phreatic craters — steam explosion pits at sites where magma probably reached the near surface but did not erupt.

Pete and John alternate the task of overseeing wellhead operations as well as other administrative tasks. Pete represents DOE’s Geoscience Research Drilling Office, charged with implementing drilling activities for this and other research drilling projects. John is principal investigator on the project, which lists 18 scientists from nine institutions. The two have worked closely and shared in development of both the scientific and drilling plans, as well as in running the field operation.

A quarter mile away up the hill, drillers are attempting to stab a three-inch bit through 3300 feet of granite, heading slantwise for the magma dike. A geologist is “sitting the well,” with the job of getting the core out, acting as a representative of the research on site, and keeping an ongoing log

and data file. A USGS wellsitter might turn over the nine-hour shift to another from Michigan State, who might then be relieved by someone from Stanford.

This morning the drill rig is silent. The drill had become bound up in loose rock or clay, and all efforts to free it have failed. The drill rods must now be cut above the obstruction (its location is still unknown) and the well detoured around them. Time is ticking by as the well lies dormant, racking

*(Continued Next Page)*



CORE SAMPLE segments detail an encounter with a magma conduit — (from left) three breccia segments, a rhyolite, and a granite.

**Continued from Page Seven**

up costs at the rate of \$4000 a day. A rod cutter has been ordered by air freight, but it hasn't arrived yet.

With that missing rod cutter on the back of his mind, Pete describes the evolution of the project from the time, less than two years ago, that a "Four Labs Proposal," involving Sandia, LANL, LLNL, and Lawrence Berkeley Lab, brought forth a program for shallow "thermal regimes drilling," authored by Eichelberger, Fraser Goff of LANL, and Art White of LBL. A certain amount of funding was allocated per laboratory, resulting in the drilling of a first well atop Obsidian Dome, and, in a separate LANL project, a 2809-foot well at the Valle Grande, New Mexico.

Later, a Geosciences Research Drilling Office was established in Dick Traeger's Exploratory Energy Systems Department 6240 for the DOE Office of Basic Energy Sciences, to handle the difficult task of planning, permitting, and running a scientific drilling effort.

"This is not a Sandia project," Pete emphasizes. "It's the Inyo Drilling Team. A lot of trust is involved, a lot of responsibility."

The head driller appears, to announce that a new cutter had arrived from Salt Lake City. The drill had broken at 4 o'clock the previous afternoon and the part is on site at 9:30 the next morning.

Later geologist Fraser Goff of LANL stops in to check the new cores. He studies the changes in texture, particularly interested in the grey streaks in the granite. "Looks good," he pronounces. "Looks like you'll hit it."

Pete explains that geo-energy companies are highly interested in developing the area. "There's industrial competition," he explains. "We don't want information on temperature to get to one company and not to another."

The next visitor is Dan Miller, USGS expert on volcano hazards, sometime wellsiter, and because of his work probably at the top of the Least-Liked-Men List among local property developers. He was principal author of a 1982 report acknowledging the "possibility of a volcanic eruption in the near future" in the Long Valley-Mono Lake area; the report details the likely hazards from such an eruption and the precautions that can be taken if one were to occur. (See related story in box.)

"I'm interested in the analogies between the Inyo craters and the seismicity and deformation in Long Valley," Dan explains. "It could give important clues to future volcanism in the Mammoth Lakes area, where there has been considerable precursory activity."

"This is one of the most exciting projects around," he adds. "Never before has anyone drilled into an intrusive magma conduit that's as young as this one."

Just before lunch Pete drives up into the ancient slag heap that's Obsidian Dome to visit a closed gray van that bears the familiar Sandia thunderbird. A cable stretches from the back of the van to a well that passes into the conduit and out the other side. Inside, sheltered from the wind, are Lou Bartel and Bob Meyer (both 6240A),



PETE LYSNE (left) at the Obsidian Dome drill rig.

huddled over a machine that measures and records the temperature downhole.

Later, in the living quarters, Pete produces a thick file of project records and explains how the cooperative Inyo Project began, after that first hole had been completed in 1983.

"It was in the fall of '83," he says. "Ike (Eichelberger) and I were up here together and hatched the basic idea. Later, at the AGU (American Geophysical Union) meeting in San Francisco we talked informally to people and talked up the idea. We invited people to 'carve a niche for yourself' in the program and to let us hear from them. So the ideas came in. In April we went to Washington with a number of investigators and talked to the DOE's Office of Basic Energy Sciences. By June we had well sites in mind, and by August we were drilling."

The same time, next day, John has replaced Pete at the site — and the drill is still stuck. The well is losing ground. The last cut was made at 900 feet, a loss of 300 feet, and the rods are still not free. The next cut will be made at a disappointing 840 feet.

John's worries about the current status of the well diminish and his enthusiasm mounts as he recounts the short history of the project.

"There had been at least a decade of talking about a scientific investigation of volcanism by drilling in this area, but no action," he says. "So we identified a target that was within reach of current budgets and technology, but which would nevertheless produce exciting new scientific results that could not be achieved through further field or laboratory studies."

"We had a lot of help, particularly from Lee Younker and Dan Miller, and from Dave Pollard of Stanford, who has done theoretical work on the dikes and how they form."

The basic idea, he says, is to sample a magmatic intrusion that is so young that it has not completely cooled and has not changed chemically since it formed. "We had to work up to this gradually, to find out what the drilling problems were," he explains. "So the holes increased in difficulty from a shallow vertical hole through Obsidian Dome, to a slant hole into the pipe or conduit that fed Obsidian Dome, to the hole we're working on now — a slant hole into the main intrusion beneath Obsidian Dome."

The first (1983) hole went 500 feet down from the top of Obsidian Dome. "We found that the flow was about 180 feet thick, and mostly obsidian," he says. "Under the flow was glacial moraine and older basalt, both of which were very nasty drilling. We started in mid-October and ended in early November. This was a modest, daytime-only operation."

"The second hole is a magma conduit hole, our first look at the intrusive part of the volcano. We wanted to come in from the side so that we could get a cross-section. We hit the conduit exactly where we predicted from the surface structure, at a slant depth of 1592 feet, and emerged in granite at a slant depth of 1960 feet. This means that the pipe that fed the eruption is about 200 feet wide."

John explains that the hole now in progress is the most ambitious because the team is trying to strike the magma at a point where it failed to reach the surface. They believe that the main intrusion is in the form of a dike, since volcanic features in this region (the Inyo chain) are arranged along straight lines, as would be expected if dikes came close to the surface, and simply because it's known from looking at eroded volcanoes that dikes are very common.

So much for the volcano's history, science, geology. But of what practical use is this research?

It's threefold, John explains. First, there's the assessment and use of geothermal and mineral resources — "when magma bodies intrude into the earth's upper crust, they set up hydrothermal systems that can be tapped as energy sources; they also concentrate minerals of economic value, such as tin and molybdenum."

Second, there's the assessment of volcanic hazard — "eruptions of this type can be extremely devastating, so they constitute a serious hazard to populated areas."

Third, there's the collection of new information about how the planet evolved — "this kind of magma is responsible for the formation of continental crust."

LATE NOTE: The team successfully broke through the volcanic dike on Oct. 24 at a vertical depth of 2160 feet, directly beneath the line of craters, at the third drill site.



## Take Note

Security inspector Keith Chavez (3435) was first runner-up at the Twelfth Annual DOE Small Arms Tournament and Training conference held last month. About 200 DOE and contractor security inspectors, couriers, and guards participated in the event held at the Central Training Academy live-fire range complex in Coyote Canyon. A security inspector from Rockwell Hanford Operations in Richland, Wa., won the event. The winners achieved the highest total scores in the following areas: a comprehensive written examination covering DOE protective force rules, orders, and regulations; DOE day and night revolver, M-16 and shotgun competition; and a stress shooting test. The conference presented training sessions on Special Weapons and Tactics, Counter-Terrorist Hostage Negotiations, Facility Inspection and Evaluation, Use of Protective Masks, and Response to Airborne Intrusion.

\* \* \*

LAB NEWS is interested in any Sandia group that has a Christmas charity project. Please call Norma Taylor (3162) on 4-7841.

\* \* \*

Interested in a Mexico heartland tour from Mexico City to Guadalajara? The YWCA Tours Committee is sponsoring such a trip for Feb. 4-13, 1985, and reservations are being taken now. A few of the features

of the 10-day tour include the pyramids of the Sun and the Moon, a cruise on Lake Patzquaro, Ballet Folklorico in Mexico City, and a tour of the town of Tequila (for which the liquor was named) and an agave plantation. Prices, deadlines, and details are available at the YWCA, 316 Fourth St. SW, or call 247-8841.

\* \* \*

The Animal Humane Association needs volunteers to work at the Weems Gallery's Christmas Art Fest at the Fairgrounds, Dec. 7-9. The AHA will receive 10 percent of the admissions collected during the three days. A large number of volunteers are needed to sell admissions, give out information, and serve as relief sitters for the 170 artists when they leave their booths. Call Ed Evans on 255-5523 if you'd like to volunteer.

\* \* \*

Yolanda Padilla-Vigil (3511) recently won a trophy for winning the extemporaneous speech category in the Toastmasters International District 23 competition. She discussed the separation of church and state, a topic she drew just before her talk.

\* \* \*

UNM's College of Engineering needs some Sandians to serve as adjunct professors for the spring semester

FORTTRAN 77 course, a 3-credit freshman class with sections that meet throughout the day (one is an evening section). If you are interested in being considered for the program, call Dick Williams, associate dean of the College of Engineering on 277-5522.

\* \* \*

The NM Chapter of the American Vacuum Society announces a call for papers to be presented at the 21st Annual Symposium to be held in Albuquerque next April 23-25. Topics include surface science, thin films, and other topics in vacuum science and technology. For more information, contact Henry Peebles (1831), symposium chairman, on 4-1647. Abstract deadline is Feb. 25, 1985.

\* \* \*

The High Pressure Subcommittee of the American Society of Mechanical Engineers will meet in Albuquerque on Dec. 5 and 6. Sandia's Safety Department has invited the group to visit the Labs on Dec. 6. Jim King (7400) will discuss Sandia's pressure safety program, and the group will visit the unique high pressure systems used in the aerodynamic research lab, the pressure test lab, and the Central Receiver Test Facility.

## Retiring



Tony Gabaldon (3424), Paul Montoya (6256), Marcus Herrera (7481)

Clarence Muchow (5117), Donald Fitchhorn (7633), Eugene Meyer (1636)



Walt Joseph (5118)



Edna Harper (5122)



Jim Gravlin (3462)



Flora Burch (3421)



Don Lewis (3441)



Wally Corder (7131)



Gil Wallace (3441)

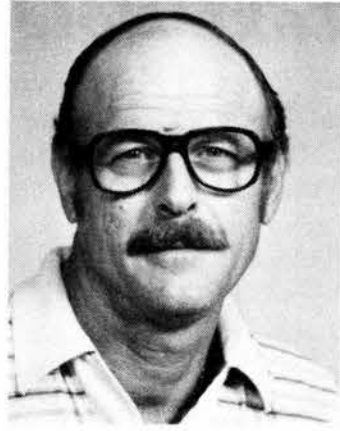


Harry Conrad (7483)

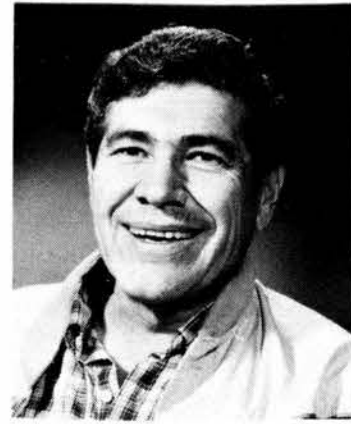
# MILEPOSTS

## LAB NEWS

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Dwayne Mohrman (8163) 25



Pablo Maes (2157) 30



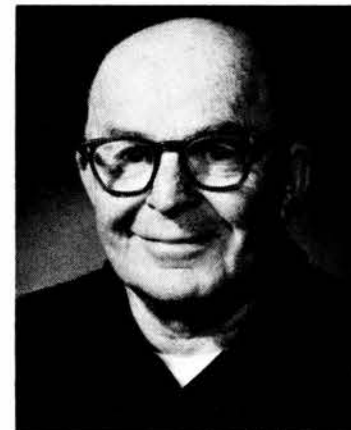
Sherry Cruz (8262) 10



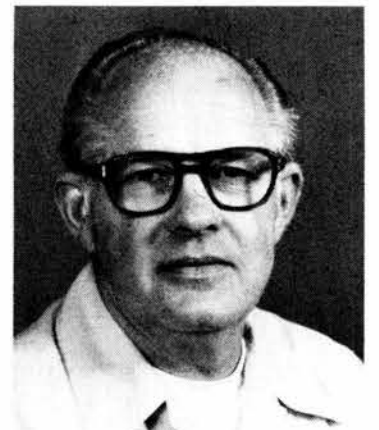
Bob Marmon (8235) 25



Mary O'Shea (8024) 25



Vincent Hansen (5232) 35



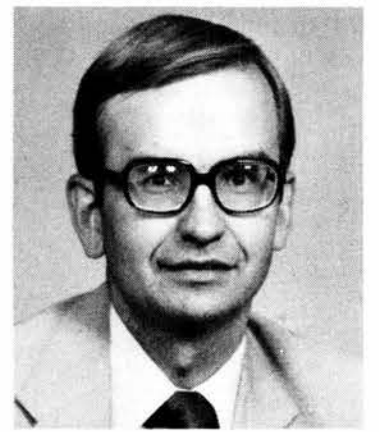
Les Jones (8463) 25



Richard Rogers (151) 20



Betty Barnhouse (8273) 25



John Vitko (8348) 10



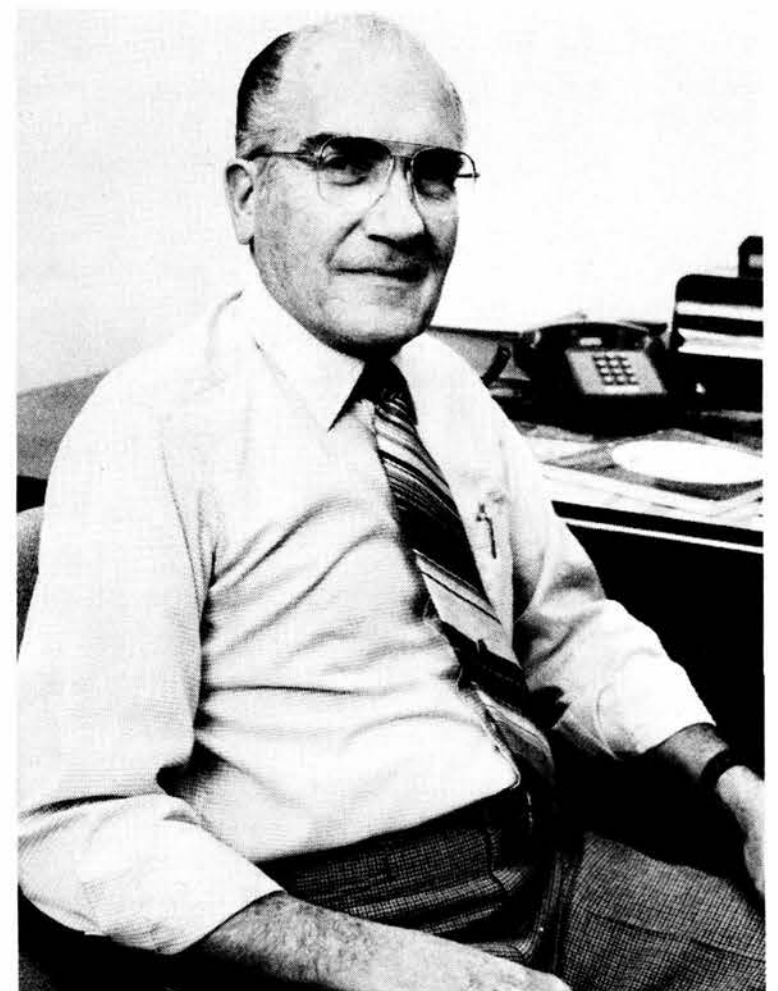
Jean Kamp (8161) 25



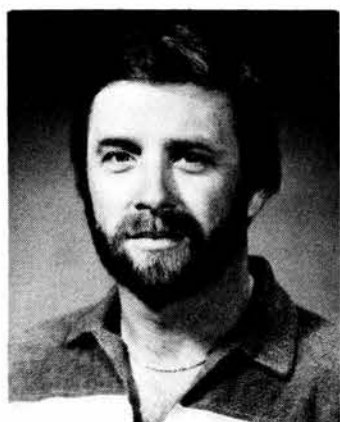
Joan Madsen (8184) 25



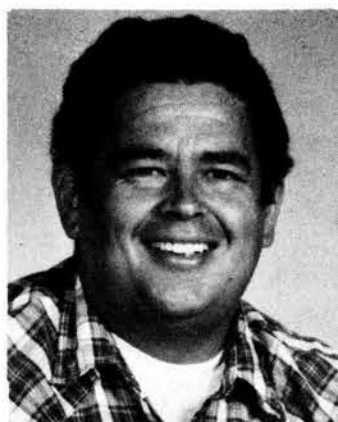
Jim Giachino (3734) 15



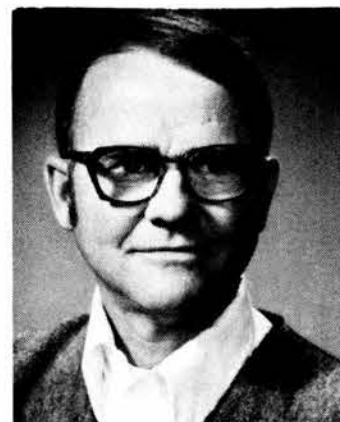
Philip Nicovich (7658) 35



Don Cook (6258) 20



Fred Perez (8257) 15



Bill Kampfe (7535) 25



AN INTERNATIONAL MEETING at Sandia recently was enhanced through the use of two interpreters, a sound booth, individual earphones, and microphones temporarily installed in Bldg. 822 by Division 3153. Jim Kennedy (2513), local arrangements chairman, obtained the equipment from LLNL, and it is available to other Sandia groups hosting international conferences. To make arrangements, contact Matt DiMercurio at LLNL, FTS 532-8990. The recent meeting was on the physics of explosives. Simultaneous translations in English and French were made by interpreters Elisabeth Canin-Lamielle and Pierre Ortiz of the French delegation.

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**MISCELLANEOUS**

TENT, sleeps 6, used twice, \$70; one-spd. bikes, men's \$25, women's \$20, child's \$15. Chhabildas, 296-3571.

BLACK face ewes & ram, \$40 ea. or four for \$150; horses. Bernal, 869-2305.

SOFA sleeper & matching print velvet chair, earthtones, \$250; girl's 20" Huffy bike w new tires & tubes, \$35. Scurry, 888-4859.

COLECO Cabbage Patch Kid, white girl w blonde hair, \$60. Wowak, 298-9398.

SET glass patio doors, fit opening 80"x71.5"; women's 3-spd. bicycle. Peters, 293-6356.

CONCHO belts, two matched, old & unusual, valued at \$900 ea., sell for \$1600 for both. Diggs, 293-5343.

BATHROOM cabinet sliding doors, \$12; utility cart, \$5; wrought iron chair & matching bench, \$35. Pinkerton, 255-2505.

RAMPE #3 industrial tumbling machine, 2 barrels, for deburring, polishing. Douglas, 281-9504.

DOUBLE bed, blond veneer finish, w/coil springs, mattress, 6-dw. dresser w/mirror, \$75. Baker, 881-9439.

FREEZER, Sears 17 cu. ft., frost-free upright, \$165. Niper, 299-6290.

GM toddler Love Seat, \$10. Vandenburg, 836-1169.

GIRL'S 20" Columbia bicycle, \$35 OBO; child's cross-country skis & poles, \$7.50. Sherman, 292-3297.

CHAIR, Lawson type, red floral slip-cover, small bdr. style, \$30. Rainhart, 821-3690.

RIFLE, 30.06 w 4X scope, Rem target rifle w 10X scope, coat, glove & gun case. Kross, 836-3860.

CAMERA system, 35mm GAF SLR, in-

cludes 28, 50, 135, 200mm lenses & auto Vivitar flash, \$225. Wessendorf, 292-2284.

DOOR, sliding glass, 5'10" wide, \$20, screen door, 32x80", \$4, steel casement windows, Geck, 299-5095.

CAR-TOP ski rack, adjustable, lockable, \$30. Roth, 265-8186.

VIC 20 computer, 1540 disk drive, 1525 printer, cartridges, super expander, programming aids, VIC monitor, \$450. Fitak, 821-8447.

OSCILLOSCOPE, Tektronix 532 w "K" plug-in, \$75; video terminal, Perkinelmer "Fox" w modem, perfect for UNM VAX, \$250. Hansen, 299-2337.

ANTIQUUE buffet (English sideboard), oak, pedestals, mirror on top, \$500 or make offer. Hartman, 294-2305.

COLT AR-15, .223 cal. assault rifle, extra magazines, brass, \$400. Ludwick, 296-6447.

THREE chairs, two velvet upholstery; framed pictures, Jerome, 294-0689.

DINETTE, 3x5 w/leaf, formica top, 4 chairs, gray black, \$125. Pelletier, 884-3726.

WOMEN'S golf clubs, 3 - 9 irons, pitching wedge, 2 putters, 3 woods w/covers, bag & cart, \$85 firm. Hines, 821-8592.

20-GAL. fish tank, complete (pump, etc.), \$30; ice skates, size 2, \$5; 19" color TV, \$30, window valances, \$5 & \$10. Preston, 821-8028.

STEREO transistor amplifier, Heathkit, 20W per channel, \$30; old tuner & turntable. Smith, 243-0714.

CHRISTMAS tree, 8', ornaments included, white, \$30. Tilgner, 294-6464.

TWO recliners, couch, coffee table, 2 lamps, table & chairs, 2 radios, TV. Carpenter, 299-4312, 10313 Apache Sat. & Sun.

BABY bed without mattress, \$40; toilet training chair, \$15. Rogers, 293-8201.

7' COUCH & loveseat (Lazy Lizard pillow furniture), \$300; dining table w/leaf & 4 chairs, \$50; trundle bed w/2 new mattresses, \$80; rocking chair, \$20. Clarke, 296-7098.

MATCHING couch & chair, \$90. Barton, 268-7349.

CABLE chains for small tires, good on radials w/narrow clearance, \$35. Graham, 281-2372.

SUEDE coat, brown w/lamb collar, \$50 OBO; Rothmoor beige coat w/mink collar, \$20, both size 12. Daniel, 268-8335.

INTELLIVISION, Mattel electronics video computer system, 16-bit microprocessor, 2 hand-held controllers, one cartridge, never used, \$65. McCarey, 822-1816.

HO TRACK, 89 sections, 32 remote

control turnouts, turntable, more, \$350 value, sell for \$99. Herrmann, 299-6571.

WATERFORD crystal, ship's decanter, \$100; perfume bottle, matching powder box, \$30 ea.; Franciscan china: 4 places Strawberry pattern, \$50. Gosselin, 884-8107.

METAL detector, Bounty Hunter, std. & mag search coils, \$115, ladies L.H. golf clubs w cart, \$45. Hall, 256-3665.

BATHROOM sink, powder blue, wall mount w legs, \$5; roll-a-way twin bed, \$40. Zirzow, 294-7296.

CARPET, 30 sq. yd. gold nylon sculptured w pad, \$50, orange gold shag, 20 sq. yd. w pad, \$10. Luikens, 881-1382.

FIVE radial 12x15 truck tires, used, waterbed mattress, waveless, 1 yr. old, make offer. Arana, 299-1214.

TABLE lamps, amber globe, 40" high, \$25 ea. Chorley, 296-1454.

MINI camper, Six Pack, tinted windows, cab lights & new lock, \$200. Solanos, 298-4523.

UPHOLSTERED chaise lounge, never used, cost \$365, sell \$265. Wright, 256-9210 after 6.

AM/FM stereo w/8 track recorder player, J.C. Penney, \$40. Reed, 268-7484.

REFRIGERATOR, counter height, \$65, dinette table, no chairs, \$15. Liguori, 255-7551.

TIRE chains, fit oversize 14" or 15" tires, bar reinforced, \$30, gasoline Jerrycan, 5-gal. w mounting bracket, \$15. Tufts, 255-9663.

**TRANSPORTATION**

'73 DODGE Dart, low miles, AT, PS, slant-6 engine, \$1000 OBO. Mowry, 892-6226.

'65 MUSTANG coupe, 200 Cl, 6-cyl., AT, AC, new upholstery, headliner & carpet, recent paint (med. red), \$2500. Lis, 822-1189.

'79 HONDA Hawk, new battery, chain, sprockets & coil, \$550 OBO. Atkins, 298-5762.

'75 VW SCIROCO, 4-spd., Clarion AM/FM, \$1850. Sanchez, 265-6791.

'74 CHEVY pickup, crew-cab, 454 engine, HD trans., 3/4 ton. Pena, 265-6791.

'72 DATSUN hatchback model 1200, 4-spd., rebuilt carb., recent battery, tires, starter, fuel pump; tuned, \$700. Swain, 265-0098.

SCHWINN Varsity boy's bicycle, 10-spd., \$75. Hudson, 821-3968.

RALEIGH Gran Prix, 15-spd., w/fenders, rack, alloy wheels, lights & reflectors, \$85 OBO. Strip, 255-7230.

'80 YAMAHA XS400 Special, windshield, crash bars, luggage rack, extra lights, 4K miles, \$900. Buza,

298-1531.

'79 SUBARU, SW, 4-WD, new engine, paint, carpet, stereo, AC, \$3500. Pierce, 299-2801 after 6.

'73 19' MIDAS mini-motorhome, dash & roof air, cassette player, bath, 44,600 miles, \$7800. Russell, 298-4949.

'78 BMW R100RS, 25K miles, Kramer bags, Koni shocks, extras, \$3500. Brinker, 293-0225 after 6.

'72 22' WINNEBAGO motorhome, fully equipped, orig. owner, \$9900. Appel, 292-0463.

'72 VW fastback, for parts, engine seized, balance OK, \$250. Kane, 881-7672.

'72 PORSCHE 914, rebuilt engine, 5K miles, Weber carbs, Koni shocks, 25 mpg, removable top, \$4200 OBO, trade. Underhill, 883-5189.

'67 VOLKS, make offer (ideal for dune buggy) Navalesi, 344-0598.

'79 PONTIAC Firebird, one owner, below book, \$3950 OBO. Gallegos, 345-7147, 344-3290.

BICYCLE, Motobecane 10-spd., mixte frame w bike rack, \$125. Robinson, 255-0114.

'83 DODGE Rampage GT sport truck, red, 5-spd., AC, PS, 9800 miles, \$6250, below wholesale for cash. Collins, 296-3347.

BICYCLE, men's 10 spd., touring, 25" frame, 27" wheels, light, generator, luggage rack, Austrian made, \$40. Russell, 298-0162.

'63 LINCOLN Continental 4-dr. convert., AM FM radio w tape deck, CPI book value \$8500, sell \$6500. Strascina, 299-2285.

'79 CADILLAC Sedan DeVille, low miles, \$7200. Curtis, 293-7602.

'84 NISSAN 200SX Turbo H.B. digital/computer pkg., AM/FM Cass., sunroof, cruise, tilt, tinted glass, louvers, fogs & more, 4700 miles. Henderson, 291-0872.

'81 HONDA CX500D, luggage rack, crash bars, fairs, cover & service manual, less than 12K miles, \$1200 firm. Zirzow, 294-7296.

'71 CHEVY Nova, 307 V8, 2-dr., AC, AT, PS, new tires, 20 mpg hwy., 100K miles, \$1100. Perdreauville, 296-2870.

'76 OLDSMOBILE Cutlass Brougham, fully equipped, make offer. Arana, 299-1214.

'83 SUZUKI RM80, \$550; '72 Kawasaki H2, 750 triple, \$550. Mon-goose BMX bike, Co. Mo. frame, cotterless alloy crank, \$100. Healer, 298-6967.

'82 SUZUKI GS1100E, 3500 miles, extras, \$2195. Gunckel, 255-4325.

'80 CHEV 1/2 ton pickup, Silverado, loaded, matching shell, low mileage, \$500 below retail, \$6350 OBO. Garcia, 293-3937.

'77 DODGE Champion mini-motorhome, loaded, \$9950. Pullen, 892-0022.

**REAL ESTATE**

3-BDR, remodeled adobe on 45 acres in Los Chavez, assumable VA loan, \$55K, terms. Taylor, 864-3338.

\$2000 down buys 1/2 ownership in 3-bdr house. Pullen, 892-0022.

WINROCK Villas Condo, 1-bdr., 653 sq. ft., carport, storage, 8% assumable loan, \$38,500. Smith, 294-3413.

FIVE heavily wooded acres off NM217, elec., phones, views, 26 mi. east, \$4300 acre, terms. Silva, 255-3723.

HATCH, NM, newly refinished 2-bdr. house. Miles, 293-4386.

CEDAR CREST, wooded 2.2 acres, Ponderosa Ranch Estates, Mora, 821-6759 after 6.

40 ACRES w/elec. & telephone available, 26 miles from Alb. on SR344, views, lots of trees, \$88K. Curtis, 281-3519.

**WANTED**

TO RENT 12 1 84 2-bdr house, have well-disciplined dog, will sign 6-mos. lease & provide extra deposit. Underhill, 266-1306.

DONATIONS of personal computer hardware & software to a 4H Club computer project. Sharp, 243-1438.

CAPABLE person w/tools to do occasional repairs on apts., wages negotiable. Shelton, 843-7501.

WATER DOG — Golden Ret., Lab, or cross, female less than 6 mos. old, free or near free. King, 298-2628.

TEKTRONIX 555 oscilloscope power supply, working or not. Miller, 294-2629.

NEED a ride to Madison, Wisc. for a bicycle; if you're flying or driving a truck, I'll pay reasonable fee for accompanying this bike. Strip, 255-7230.

SCHWINN exercise cycle. Arenholz, 298-1724.

CLOCK repairman to fix and clean old wall-hung type pendulum clock. Starzynski, 299-3489.

CEMENT MIXER on wheels, 3 cu. ft., w/motor; 6' and 8' double-glazed sliding glass doors. Andersen, 294-8624.

20" BIKE w/banana seat, in good condition. Douglas, 281-9504.

DOG HOUSE lg. enough to accommodate Springer Spaniel. Sheldon, 293-0467.

DEER HIDES, any size or condition. Wade, 869-3934.

FOOTBALL pants for 185 lbs., also elbow pads. Baxter, 344-7601.

## When Your Relationship with Your Vehicle Is on The Skids

Given last month's 20-minute transition from summer to winter, we're already too late with these winter driving tips. But if you and your vehicle are still in one piece, it's a good time to do all you can to ensure that both of you stay that way.

### Maintenance Tips

1. Check your brakes and adjust them if necessary.
2. Change oil to winter weight (10 or 20 SAE); or use a multi-weight oil (10-40, for example).
3. Add anti-freeze to protect your radiator coolant down to at least 0°F, lower if you live in the mountains.
4. Make sure your battery, even if it's a "maintenance free" type, has the proper amount of water.
5. Check battery connections. It takes more power to start an engine in cold weather; that means you need a good battery with tight, non-corroded connections.
6. Install mud/snow tires. Or, at least, make sure your regular tires have plenty of tread left.
7. You're going to be driving less often in daylight, so keep headlights, tail lights, and signal lights working and clean.
8. Check muffler and exhaust systems for leaks. Carbon monoxide can seep into a vehicle, especially if you're stalled with the windows rolled up for warmth (see below).
9. Make sure the defroster and the windshield sprayer are working and that windshield wipers work well. Replace old wiper blades.
10. Make sure your tire chains fit your tires. Replace any worn chain links.
11. Tune up your engine for easier starts.

### Driving Tips

1. In bad weather, allow yourself extra time to get to your destination.
2. Check weather forecasts before you leave, and stay tuned along the way to stations that carry local weather information.
3. When road surfaces are wet or snow-covered, drive more slowly (though not so much as to stall you on an upgrade). If possible, try to match the speed of the majority of the traffic.
4. When it's necessary to slow or stop, pump brakes lightly and/or shift to a lower gear.

5. Remember that there is *no* way to stop quickly. Be prepared to head for a ditch or even scrape your vehicle on a guard rail, rather than hit another vehicle, in order to stop.

6. If the road is ice-covered, put on chains or get off the road (preferably, this will be a deliberate choice). Remember that bridges and overpasses often are icy even when the rest of the road is clear.

7. Do remember what kind of car you're driving — if it's front wheel drive, *don't* put the chains on the rear wheels! If it's four wheel drive, put the chains on the wheels carrying most of the vehicle's weight (if not on all four wheels), says Ross Wilcox, head of the Safer Winter Driving League.

8. If you go into a skid, take your foot off the accelerator, turn in the direction of the skid, and don't touch the brake.

9. Except in clear weather, use your headlights even if they don't help you see better. They do help you *be seen* by other drivers ahead of you, especially the types whose rear windows and mirrors are fogged up or iced over.

10. Use turn signals religiously, even if you're lax about it normally. Other drivers need more time to react to your turns and lane changes when road surfaces are slippery.

11. Pull off the road *before* you get stuck. (If you can't, turn on emergency flashers and get out of the vehicle immediately, no matter how cold it is.)

12. If you're stalled beside the road, use the blankets in your emergency gear (see below) to keep warm. Running the engine and heater is dangerous because carbon monoxide is likely to enter the stopped vehicle (once you're stopped, there's no wind to blow it away); that can put

you to sleep permanently. If you must run the engine and heater, stay awake! If you find this difficult, you're probably getting exposed to carbon monoxide (and, no, you can't smell it first).

13. Remember that safety belts are never out of season. They're your cheapest, and most effective, life insurance.

14. Don't drink and drive at any time.

15. And, of course, keep windshields and rear and side windows clear at all times.

### Emergency Gear

Carry these in your vehicle: shovel, tire chains, a bag of sand or rock salt or a set of traction mats, tow chain, booster cables (see LAB NEWS, Dec. 16, 1983, for safe use of booster cables), snow brush and ice scraper, flashlight, flares, blankets or sleeping bags, extra coats, boots for walking in snow and rain.

Some of these tips come from the NM Transportation Department's Traffic Safety Bureau, others from the National Safety Council and from experienced winter drivers. If you have other life- or vehicle-saving winter driving tips, send them to the LAB NEWS; if the Safety Department agrees they're worth sharing with others, we'll publish them.

### Serendipitous Stupidity

"In purely pragmatic terms, stupidity might be regarded as the inability to cope with novel situations. Even if the inability to deal successfully with novelty—or even normality—must usually be debilitating, it can be, on occasion, advantageous. The Viking discovery of North America is a case in point. Although it sounds like an earlier-day (ethnic) joke, the Vikings did, in fact, discover America because they couldn't turn their boats around."

*Speculations in Science and Technology, 1984*



## Coronado Club Activities

### Happy Hour In Lounge Tonight

TONIGHT, Happy Hour will be observed in the main lounge only. There'll be a free spread of munchies and goodies. Robin Arquette, singer/guitarist, will entertain.

NEXT TUESDAY, Nov. 20, Jim Zitzman of American First Financial will conduct a financial seminar on "bond swapping" as an investment strategy. The meeting starts at 7:30. There is no admission charge.

NEXT FRIDAY, Nov. 30, the dining room offers your choice of prime rib or deep fried shrimp as two-for-one specials for \$10.95. Karen Edwards will instruct free country and western dance lessons from 7:30 until 8:30. Western Flyer will play for dancing from 8:30 until 12:30.

ANNUAL KIDS' CHRISTMAS PARTY is scheduled this year for Saturday, Dec. 1, starting at 9:30 a.m. Puppeteers Ron and Mary Kay Day will present an original show with Big Red, Zelda, and the rest of puppets singing and dancing in a holiday mood. Santa and Mrs. Claus will stop by with gifts for the little ones under 12. Admission is a can of food to be donated to the South Highway 14 Village Project. Members' children only, please.

THE BIG ONE next month setting the stage for the holiday season is scheduled on

Friday, Dec. 7. Happy Hour prices will prevail all evening, and the dining room is featuring two-for-one filet mignon for \$10.95. A dozen bottles of champagne will be given away as door prizes. Singer Robin Arquette will entertain in the main lounge from 5 to 8 p.m. Manager Mitch is on the trail of a fine variety band to book for the occasion. Reservations are a good idea for this one; call 265-6791.

TRAVEL — A film and talk on traveling in Spain and Portugal is scheduled in the ballroom at 7:30 p.m. on Tuesday, Dec. 11. Bolack International Travel is presenting the program. Marv Plugge (5171), travel director, says that air fare discounts and the strong dollar make travel to Europe in 1985 a very attractive proposition.

SKIING — Here's an update on the status of Coronado Ski Club extended ski trips. This first group of trips is currently full, but any new signups are being placed on waiting lists: Wolf Creek (12/7-9), Utah-Christmas (12/26-30), Monarch (1/4-6), Crested Butte (2/8-11), and Telluride (2/15-18).

Space is still available on the following trips, and these trips are now open for signups by non-CSC members: Vail-USRSA (1/12-19), Purgatory I (1/20-23), Central Colorado/Dillon (2/2-6), Utah II (2/23-27), Purgatory II (3/1-3), Tahoe-FLY (3/9-16), and Jackson Hole-FLY (3/23-30).

## Welcome

### Albuquerque

- Iris Aboytes (21-1)
- Charla Carter (21-1)
- Craig Edwards (7473)
- Marjorie Elson (22-2)
- Darrell Green (1252)
- David Hendricks (1248)
- Doris Hoffman (22-2)
- Muriel Larson (21-1)
- Robert Lawson (1248)
- Kenneth Penn (1252)
- Robert Shirey (3426)
- Linda Sparling (22-2)
- Linda Stefoin (154)
- Bernard Sujka (1252)
- Julie Walker (22-2)

### New Mexico

- Wendy Blend (21-1)
- Kenneth Harris (2543)
- Willie Jaramillo (1244)
- Robert Meyers (3642)
- Lorenzo Salgado (1811)

### New York

- Clifford Loucks (2545)

### Texas

- Dan Williams (3442)